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09/901,012	07/10/2001	Hideyuki Toriyama	204552020800	7645

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EXAMINER	
ROSARIO-VASQUEZ, DENNIS	

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5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/901,012	TORIYAMA, HIDEYUKI	
	Examiner	Art Unit	
	Dennis Rosario-Vasquez	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 07/10/01.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-12 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-12 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 07/10/01 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (US Patent 6,151,419 A) in view of Li et al. (US Patent 6,360,009 B2).

Regarding claim 1 Aoki teaches an image reading method and device (Fig. 4) for obtaining a shading correction coefficient (fig. 1, label: White reference correction coefficient, "C" or fig. 4, num. 201, is inputted to a shading correction unit 13) for correcting image data obtained by reading a document image (fig. 4, num. 202), comprising the steps of:

a) reading a reference plate (fig. 5, num. 9 and fig. 4, num. 201) in a main scanning direction (fig. 5, vertical two-headed arrow) plural times (The plate is read in the main scanning and sub-scanning directions) at different positions (A line sensor has a plurality of photoelectric converting elements along the sensor for reading at col. 6, lines 30,31) in a sub-scanning direction perpendicular to the main scanning direction (Fig. 5 shows a main scanning 9 and sub-scanning 10 directions that are

perpendicular.) with use of a plurality of image sensors (Plurality of photoelectric converting elements of the line sensor) aligned in the main scanning direction (The sensor has main scanning and sub-scanning portions at col. 6, lines 49-53);

b) calculating a difference per image sensor (Dw-Dk or Lo is a difference between the white reference and black reference data for each photoelectric element of the sensor at col. 6, line 30,31. Note that Dw-Dk is calculated at the step of figure 4, num. 201.)

Aoki does not teach the step of calculating a difference between a maximum and average of the image sensor readings. However Aoki does suggest using a portion of a reflection plane having a uniform high reflectivity for reading by the photoelectric converting elements of the line sensor to obtain the value Dw or white reference data at col. 6, lines 21-24,28,29.

However, Li et al. does teach the use of calculating a difference (Li et al. computes a gray level difference between a peak and a neighborhood average at col. 7, lines 66,67) per image window between a maximum value ("peak" at Li et al., col. 7, line 65) among a plurality of readings from each image window (Using figures 8A and 8B, Li et al. computes a difference between a peak and its neighbors at col. 7, lines 59,60) and an average value of readings from each image window (Li et al. computes an 8 X 8 window neighborhood average at col. 7, lines 10, 11, 67 and col. 8, lines 22-25);

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Aoki's teaching of reading a portion of a reflection plane having high reflectivity, Dw which is used in the difference Dw-Dk, with Li et al's difference formula with an average, because Li et al.'s difference formula provides a correct classification of highlight or high reflectivity area during reading of a window (Li et al., col. 8, lines 4,7-9).

c) obtaining the shading correction coefficient (Aoki, fig. 4, num. 205 or "C") by modifying a correction coefficient ("C" is modified by using a ratio as shown at Aoki, col. 7, line 48.) for correcting the image data so that the maximum value, Dw or white reference data of Aoki, of each image sensor (Photoelectric elements of the sensor 5, fig. 1 of Aoki) becomes a specified image level (using figure 7, the level of the white reference data or Dw is shown as a higher curve immediately after the power supply is turned on. After a predetermined time has passed Dw has a lower curve.) in correspondence to the difference of each image sensor (The difference between Dw and Dk is used in the equation at col. 7, line 48 to correct the variation of figure 7 at col. 7, lines 36-41.)

Regarding claim 2, Aoki and Li et al. teach the image reading method for obtaining a shading correction coefficient as defined in claim 1, wherein

The average value of readings from each image sensor is an average value of readings obtained by once (Aoki states that once the difference, Dw-Dk, is stored (fig. 4, num. 201) then it is possible to omit a calculation during reading...at subsequent steps

as shown in figure 4, numerals 202,203,205 and 206.) reading a reference plate in the main scanning direction.

Regarding claim 3, Aoki and Li et al. teaches the image reading method for obtaining a shading correction as defined in claim 1, wherein the average value of readings, Dw of Aoki, from each image sensor (Aoki: figure 1, num. 5:line sensor) is an average value of readings obtained by reading the reference plate (fig. 5, num. 9) in the main scanning (Figure 5 has a vertical arrow as the main scanning direction) direction plural times (The line sensor of figure 5 has a plurality of photoelectric conversion elements).

Claim 4 is similar to and addressed in claim 1, except for the additional elements which are taught by Aoki et al. of requiring obtaining the shading correction coefficient (White reference correction coefficient of figure 1 or "C" of Aoki) by adding (Using figure 1, multiplying circuit 25 is another form of addition.) a value (Dw-Dk is outputted from figure 1, num. 21) corresponding to the difference of each image sensor (Dw-Dk is a difference of one photoelectric conversion unit from a line senor at time with light Dw and a time without light Dk.) to a correction coefficient ("C" is multiplied by Dw-Dk at col. 8, line 24.) so that the maximum value (Dw is obtained using a reference plate with high reflectivity) of each image sensor becomes a specified image level (This last element of claim 4 was addressed in claim 1.).

Claim 5 is similar to and addressed in claim 1, except for the additional elements which are taught by Aoki et al. of calculating a difference ("difference between the pixel [emphasis added] and the neighborhood average" at Aoki, col. 7, lines 66,67) between an average value of maximum values (Fig. 8A is a 24X8 window that has black dots that represent peaks, and each dot has 8 surrounding pixels that will be averaged to obtain a video average which corresponds to the black dots of peaks at col. 7, lines 51,52 and col. 8, lines 22-25.) among a plurality of readings (Each 24X8 window is formed of three 8X8 windows to obtain an average for "the pixel" based on the 8 immediate neighbors of the 8X8 window.) from each image window and an average value ("neighborhood average" at col. 7, line 67 is another average in addition to the video average which corresponds to "the pixel" or dot above, and "the pixel" or dot is used in a difference with the neighborhood average as described at col. 7, line 67. Thus a difference between a video average and a neighborhood average is implemented to determine a threshold.) of readings from each image window.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Aoki's teaching of using a portion of a reflection plane having high reflectivity, Dw, with Li et al's difference formula for the same reason as claim 1.

Claim 6 was addressed in claim 2.

Claim 7 was addressed in claim 3.

Claim 8 was addressed in claims 1 and 5 except for the additional elements, which are taught by Aoki et al. of an image-reading device (fig. 1, num. 5):

A calculation section (fig. 1, numerals 5,12 and 21) for reading a reference plate (fig. 1, num. 5) in the main scanning direction plural times at different positions in a sub-scanning direction perpendicular to the main scanning direction with the use of the image sensors (This element of claim 8 was addressed in claim 1) and calculating a difference between an average value of maximum values among a plurality of readings from each image sensor and an average value of readings from each image sensor (This element of claim 8 was addressed in claim 5).

An operation section (fig. 1, num. 13 which comprises numerals 21,23,25) for obtaining the shading correction coefficient (Numeral 13 obtains a "WHITE REFERENCE CORRECTION COEFFICIENT") by modifying a correction coefficient for correcting the image data so that the maximum value of each image sensor becomes a specified image level in correspondence to the difference of each image sensor (The remaining elements of claim 8 were addressed in claim 1); and

A correction section (fig. 1, num. 16) for correcting image data, Dw, obtained by reading a document image with use of the image sensors (fig. 1, num. 5:line sensor) through the shading correction coefficient ("C" or shading correction coefficient is obtained from figure 1, label: "WHITE REFERENCE CORRECTION COEFFICIENT", modified within num. 13 and outputted to 16: "ANOTHER CORRECTING UNIT".).

Claim 9 was addressed in claims 4 and 5.

Claim 10 was addressed in claims 1 and 8 except for the additional elements which are taught by Aoki et al. of:

a) calculation means (Aoki, fig. 1, numerals 5,12 and 21). The respective remaining elements were addressed in claim 8.

b) amplification means (Aoki, fig. 3, num. 11) for amplifying image signals read by the image sensors (fig. 3, num. 5); and

c) gain adjustment means (fig. 1, num. 13 or fig. 3, num. 13) for changing an amplification factor (Using figure 3, "Dn" or amplification factor was obtained by the sensor 5 and amplified by 11) of the amplification means (Fig. 3, num. 11) in correspondence to the calculated difference ("Dn" is changed to "Dn'" according to the equation with the difference Dw-Dk as shown in column 1, line 62 or according to the operators of figure 13, numerals 21,23, and 25.).

Claim 11 was addressed in claims 9 and 10.

Claim 12 was addressed in claim1 except for the additional elements which are taught by Aoki et al. of an image reading device, comprising:

a) amplification means (fig. 3, num. 11) for amplifying signals, Dw or Dn, representing images of a reference intensity plate, Dw or white reference data corresponding to a plate, or an image document, Dn or uncorrected data from an original, with a specified amplification factor (Aoki states,"...data [(Dw or Dn)]...owns a specific value with respect to each of the photoelectric converting elements of the line sensor 5 (Aoki, col. 6, lines 30,31).") to provide readings (The readings of Dw or Dn are

provided to 13 via 12 for shading correction.) of the reference intensity plate or readings of the image document;

Aoki does not teach a means of calculating a peak value from the readings of a plate, but Aoki does suggest using a high reflectivity plate for obtaining Dw or white reference data for reading at col. 6, lines 16-21 and teaches the remaining elements starting from compensation coefficient setting means as described below.

However, Li et al. does teach elements b thru e of:

b) peak value calculation means (fig. 2, label: "PEAK/VALLEY DETECTION") for calculating a peak value of the readings of video (fig. 2, label: VIDEO CONTENT BUFFERS").

c) storage means (fig. 2, label:" PEAK ARRAY BUFFER") for storing the peak value.

d) average value calculation means (fig. 2, label: "PEAK/VALLEY DETECTION" calculates an average at col. 8, lines 27-29) for calculating an average value of the readings of video.

e) difference data calculation means (Fig. 2, label: "COMPUTATION") for calculating difference data (fig. 2, label "ROUGHNESS" computes difference data between gray values of a 3 X 3 window formed from a 5 X 5 window of fig. 2, label: "VIDEO CONTENT BUFFERS".) between the peak value (Fig. 2, label: "PEAK ARRAY") and the average value (Fig. 2, label:" PEAK/VALLEY DETECTION" computes an average which is inputted into the "PEAK ARAY" at col. 8, lines 22-25.);

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the high reflectivity reading of Aoki with the teaching of Li et al.'s peak value calculation means for the same reason as claim 1.

Aoki teaches the remaining elements of claim 12 of:

f) compensation coefficient setting means (Aoki, fig. 1, label: " WHITE REFERENCE CORRECTION COEFFICIENT") for setting a compensation coefficient, ("WHITE REFERENCE CORRECTION COEFFICIENT" or "C", through use of the peak value, Dw or white reference data, stored in the storage means (fig. 1, num. 24: "WHITE REFERENCE STORAGE UNIT") as shading compensation reference data (Dw is used within numeral 13 or shading correcting unit to correct the shading);

g) compensation means (fig. 1, num. 13:"SHADING CORRECTION UNIT" as described within the section titled "(4) SETIING OF WHITE REFERENECE CORRECTION COEFFICIENT" at col. 7, line 13,14.) for compensating readings ("Dn") of the image document through use of the compensation coefficient (fig. 1, num. 13 uses "C" as an input obtained from the " WHITE REFERENCE CORRECTION COEFFICIENT" of figure 1.) ; and

h) gain adjustment means (fig. 1, num. 23:"DIVIDING CIRCUIT" and num. 25: "MULTIPYING CIRCUIT" which is a part of the SHADING CORRECTON UNIT of figure 3 adjusts the gain in another depiction of figure 1 as shown in fig. 3, num. 11.) for changing the amplification factor, Dw or Dn, of the amplification means according to the difference data (fig. 1, num. 21:"SUBTRACTING CIRCUIT" subtracts either Dw-Dk for the reference plate or Dn-Dk for a document depending on the mode of operation.) so as to make the amplification factor, Dw, for use in the case where the amplification means (fig. 3, num. 11) amplifies representing images of the reference intensity plate (Once the system is turned on the intensity plate is automatically read at col. 6, lines 3-5.) different from the amplification factor, Dn, for use in the case where the amplification means amplifies signals representing images of the image document (A user instructs the system using an interface to determine whether or not an original is read at col. 6, lines 60-67). Therefore the difference between the amplification factors is that the first factor Dw is based on the initial powering, while the other factor Dn is based on user input.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sugiura (US Patent 6,704,457 B1) is pertinent as teaching a method of averaging shading data at figure 2, num. S13.

Irving et al. (US Patent 6,658,164 B1) is pertinent as teaching a method of determining correction coefficients using a linear gain equation as shown graphically in figure 7c and col., line -. 7, lines 8-18.

Kunishige (US Patent 6,249,615 B1) is pertinent as teaching a method of generating correction coefficients for each element of a CCD at col. 13, lines 54-56.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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